UNITED STATES PATENT AND TRADEMARK OFFICE

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| Application Number | : | 10/621,334 | § | Confirmation No. 2510 |
| Applicant | : | Wendell Watkins | § | |
| TC/A.U. | : | 3735 | § | |
| Examiner | : | Sanjay Cattungal | § | |
| Filing Date | : | July 18, 2003 | § | |
| Title | : | Biomimicking Applications Of Human Sensory Systems | § | |
| Customer No. | : | 23609 | § | |

**DECLARATION OF WENDELL WATKINS PURSUANT TO 37 CFR §1.63**

I, Wendell Watkins, a citizen of the United States and resident of El Paso, Texas, whose home address is 3302 Gabel, El Paso, Texas 79904, believe that I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "Biomimicking Applications of Human Sensory Systems."

I hereby state that I have reviewed and understand the contents of the above identified application, including any claims, as amended. I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I have reviewed the examiner's findings as given by Sanjay P. Cattungal and Brain L. Casler for application 10/621,334 Art Unit 3768 ("Application") in the Final Office Action dated July 13, 2006 ("Final Office Action"). The main issue here is the explanation of how the process for the Watkins Publication and the Application work. When the sensor fusion work was performed for the Watkins Publication, the issue of how the use of stereoscopic vision applied to enhancing the target acquisition process was not known. I and my co-authors plainly stated that in line 9 of the Abstract of the Watkins Publication. Also, foveal vision was not mentioned in the paper or the issue of processing time difference between the foveal and the pre-attentive (surround vision) processes. I did not know how to design the stereoscopic display for training pre-attentive depth perception or why that is what is needed to enhance one's ability to accurately track a baseball. I did not understand the mechanism that causes dyslexia or how to correct the dyslexic's lack of orientation calibration of their foveal vision. Basically, I did not know how the human vision system is designed to efficiently handle search and target acquisition/ identification tasks.

In comparing the Watkins Publication to the Application, it is not the use of pre-attentive vision that is new or the use of stereoscopic vision. Nor is it the use of computer generated red-green-blue

computer assisted design images that is new. The intent of the research results that were presented in the Watkins Publication was whether human stereoscopic vision of the human eyes' cone sensors could be used to enhance search and target acquisition. It didn't matter whether this was for pre-attentive vision or foveal since both utilize cone sensors. Stereoscopic images are usually fused using the pre-attentive vision but can then be interrogated with foveal vision.

In the Final Office Action, the Examiner refers to the text on pages 61 to 63 and Figure 3 of the Watkins Publication as a basis for the display presented in the Application. Even though they may appear the same and that the Application is merely an extrapolation of that given in the Watkins Publication, they are not the same at all. Figure 1 on page 62 of the Watkins Publication is a depiction of the overall process and has no angular or range dimensions associated with it. The image shown in Figure 2 on page 63 of the Watkins Publication presents the depictions used for sensor fusion. For comparison I have included a composite Figure A where Figure 2 on page 63 from the Watkins Publication is on the left and a sample of an image used for depth perception training in the Application is on the right.

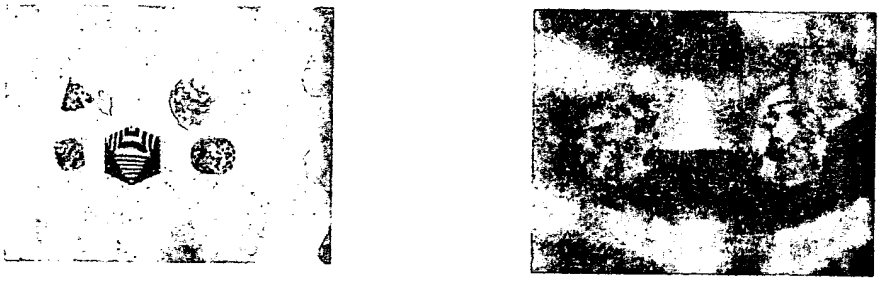

Figure A: Comparison of Watkins Publication (left) to Application (right)

The order of the objects shown in the left image picture is as given in Figure 4 on page 64 of the Watkins Publication. The objects are numbered 1 through 5 from left to right. The horizontal extent of both the left and right images is 20 degrees when they are viewed for testing and training. The separations between the objects in the left image is as follows: between #1 and #2 is 1.56°, between objects #1 and #3 is 1.25°, between #3 and #4 is 1.56°, between #3 and #5 is 1.88°, and between #4 and #5 is 0.94° all of which are less than the 2° extent of the foveal vision. The separation of the two spheres shown in the right image is 4.84°, and the separations of the outer edges of the spheres and the edge of the scene is 2.65°. Does this make such a big difference? The answer is absolutely yes. Why? Well, there was a mistake made in "Watkins." At the time, as stated above, I and my co-authors did not know exactly how the human mind did the sensor fusion. We attributed it to solely pre-attentive vision, and it is true that the initial fusion is done pre-attentively. But, once this is accomplished the viewer can interrogate the scene using their attentive vision that has much higher spatial and color resolution. The task that was to be performed by the observers in the Watkins Publication was (as stated on page 64, lines 6-8) : "The 72-scene test was then started by instructing the observer to state which object number appeared closest and then determine its shape, and then to continue to do the same for the other 4 objects in the scene." The data did not show statistical significance for the determination of the object's depth perception range in the scene but did for the object identification as shown in Table 1 on page 64 of the Watkins Publication. The observers looked at the individual objects and were not able to make accurate depth perception determination between the objects, but were able to use the color

sensor fusion to identify them! The depth perception task needs to be performed using pre-attentive vision only. That is the big difference between the two technologies. Using the methodology of the Watkins Publication, no one would be able to say to a baseball coach – "I'd like to train your players to track pitches better by not looking at the baseball." The reason is that it is counter intuitive to use pre-attentive vision to track fast moving objects. This can be illustrated and verified by training using the right scene of Figure A above but not the left!

I began performing investigative research on my own with my own resources into how the human brain processes vision especially stereoscopic vision. What I discovered was how the human brain performs search and target acquisition. This is the basic underlying technology for all the claims listed in the application 10/621,334. This technology is not derivable from the technology contained in the Watkins Publication. The technology breakthrough occurred when I was able to explain how I could juggle multiple objects. This requires simultaneously tracking multiple objects at the same time. I tracked these objects by looking passed them and not at them. I measured the background feature shifts that were present while I was juggling and determined that my depth of field vision was centered in space approximately 50% further away than the objects being juggled. I was thus focusing my surround vision on an imaginary plane in space 50% beyond the objects. If I ever looked at any of the objects being juggled, I could not keep track of the other objects and could not continue juggling. I now knew that I could only use the surround vision and not the foveal vision for tracking the objects. At this point, I knew what the missing piece of the puzzle was. It is the visual process timing that is the key. The vision processes for the surround vision are performed in the right side of the brain. The vision processes for the foveal vision are performed in the left side of the brain. The human brain is like a car with two gears. The left side of the brain uses the lower gear (five refreshes per second). It is very thorough but slow. The right side of the brain uses the higher gear (25 to 30 refreshes per second). It performs survival functions very quickly. Trying to perform tasks that use both sides of the brain can cause confusion, for example, the Stroop effect. Information can be transferred between the two sides of the brain through the Corpus Collasum, but it is not very efficient. So in order to accurately track a baseball the batter should not look at the ball but rather passed it with their surround vision (pre-attentive). If one wants to train a baseball player to have this vision capability, the training technique must not be able to be performed using the foveal vision that is too slow (2-3 refreshes during a fastball pitch). Other senses can be used to enhance this training provided the input is to the correct side of the brain. For example, an object tracker could be used to provide real-time position for a pitched baseball with respect to home plate by providing a sound that increases in pitch until the baseball reaches home plate. A batter would then be able to correlate their visual tracking accuracy with a sound that the brain can process on the right side of the brain. If, however, a verbal response of "early" or "late" is used for a batter's swing at a pitched baseball, the sound must be processed using the left side of the brain after the visual tracking by the right side of the brain is finished and is of much less benefit.

It is very unlikely that a person could derive the methodology of the Application using the Watkins Publication. Some of the stereoscopic scenes derived from that paper were tried for depth perception training and did not work. The main problem was that the scenes were not properly designed to force the person being trained to use only surround vision. Some of the subjects found ways to use their foveal vision to accomplish the task more efficiently. Note, that the results that were listed in the Watkins Publication were results for an identification task that uses foveal vision and not one that uses surround (pre-attentive) vision. The objects, in Figure 2 on page 63 of the paper referred to as "Watkins," were in fact too close together (less than the foveal vision extent).

**WARNING**

The undersigned being hereby warned that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and that such willful, false statements may jeopardize the validity of the application or any resulting registration, declares that he/she believes the applicant to be the owner of the mark sought to be registered, or, if the application is being filed under 15 U.S.C. §1051(b), he/she believes applicant to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use said mark in commerce either in identical form thereof or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and that all statements made of his/her own knowledge are true and that all statements made on information and belief are believed to be true.

By: Wendell Watkins

Wendell Watkins

Date: 12 Sep 06